Amendments to the Claims:

Listing of Claims:

1. (Currently amended) A method for operating an atomic clock comprising the steps of:

generating atoms in a ground-state sublevel of maximum or minimum spin from which end resonances can be excited; and

exciting magnetic resonance transitions in the atoms with magnetic fields oscillating at Bohr frequencies of the end resonances wherein the atoms are pumped with circularly polarized D_1 resonance light.

2. (Original) The method of claim 1 wherein the magnetic field oscillates at the Bohr frequency ω- of the resonance.

3. (Original) The method of claim 1 wherein the magnetic field oscillates at the Bohr frequency ω+ of the resonance.

4. (Original) The method of claim 1 wherein said atoms are rubidium atoms or cesium atoms.

5. Cancelled.

6. (Currently amended) A method for operating an atomic clock comprising the steps of:

generating atoms in a ground-state sublevel of maximum or minimum spin; and

pumping the atoms with light modulated at a Bohr frequency of the end resonance for exciting transitions in the atoms wherein the atoms are pumped with circularly polarized D_1 resonance light.

7. (Original) The method of claim 6 wherein the light is modulated at the Bohr frequency ω- of the resonance.

8. (Original) The method of claim 6 wherein the light is modulated at the Bohr frequency ω+ of the resonance.

9. (Original) The method of claim 6 wherein said atoms are rubidium atoms or cesium atoms.

10. Cancelled.

11. (Currently amended) A system for operating an atomic clock comprising:

means for generating atoms in a ground-state sublevel of maximum or minimum spin from which end resonances can be excited; and

means for generating hyperfine transitions of said atoms by applying magnetic fields oscillating at Bohr frequencies of the end resonances and pumping the atoms with circularly polarized D_1 resonance light.

12. (Original) The system of claim 11 wherein the magnetic field oscillates at the Bohr frequency ω- of the resonance.

13. (Original) The system of claim 11 wherein the magnetic field oscillates at the Bohr frequency ω+ of the resonance.

14. (Original) The system of claim 11 wherein said atoms are rubidium atoms or cesium atoms.

15. Cancelled.

16. (Currently amended) A system for operating an atomic clock comprising:

means for generating atoms in a ground-state sublevel of maximum or minimum spin, from which end resonances can be excited; and

means for pumping the atoms with light modulated at a Bohr frequency of the end resonance for exciting transitions in the atoms wherein the atoms are pumped with circularly polarized D_1 resonance light.

17. (Original) The system of claim 16 wherein the light is modulated at the Bohr frequency ω- of the resonance.

18. (Original) The system of claim 16 wherein the light is modulated at the Bohr frequency ω+ of the resonance.

19. (Original) The system of claim 12 wherein said atoms are rubidium atoms or cesium atoms.

20. Cancelled.

21. (Currently amended) A method for operating a magnetometer comprising the steps of:

generating atoms in a ground-state sublevel of maximum or minimum spin from which end resonances can be excited; and

exciting magnetic resonance transitions in the atoms with magnetic fields oscillating at Bohr frequencies of the end resonances and pumping the atoms with circularly polarized D_1 resonance light.

22. (Original) The method of claim 21 wherein the magnetic field oscillates at the Bohr frequency ω- of the resonance.

23. (Original) The method of claim 21 wherein the magnetic field oscillates at the Bohr frequency ω+ of the resonance.

24. (Original) The method of claim 21 wherein said atoms are rubidium atoms or cesium atoms.

25. Cancelled.

26. (Currently amended) A method for operating a magnetometer comprising the steps of:

generating atoms in a ground-state sublevel of maximum or minimum spin; and

pumping the atoms with light modulated at a Bohr frequency of the end resonance for exciting transitions in the atoms wherein the atoms are pumped with circularly polarized D_1 resonance light.

27. (Original) The method of claim 26 wherein the light is modulated at the Bohr frequency ω- of the resonance.

28. (Original) The method of claim 26 wherein the light is modulated at the Bohr frequency ω+ of the resonance.

29. (Original) The method of claim 26 wherein said atoms are rubidium atoms or cesium atoms.

30. Cancelled.

31. (Currently amended) A system for operating a magnetometer comprising:

means for generating atoms in a ground-state sublevel of maximum or minimum spin from which end resonances can be excited; and

means for generating hyperfine transitions of said atoms by applying magnetic fields oscillating at Bohr frequencies of the end resonances and pumping the atoms with circularly polarized D_1 resonance light.

32. (Original) The system of claim 31 wherein the magnetic field oscillates at the Bohr frequency ω- of the resonance.

33. (Original) The system of claim 31 wherein the magnetic field oscillates at the Bohr frequency ω+ of the resonance.

34. (Original) The system of claim 31 wherein said atoms are rubidium atoms or cesium atoms.

35. Cancelled.

36. (Currently amended) A system for operating a magnetometer comprising:

means for generating atoms in a ground-state sublevel of maximum or minimum spin, from which end resonances can be excited; and

means for pumping the atoms with light modulated at a Bohr frequency of the end resonance for exciting transitions in the atoms wherein the atoms are pumped with circularly polarized D_1 resonance light.

37. (Original) The system of claim 36 wherein the light is modulated at the Bohr frequency ω- of the resonance.

38. (Original) The system of claim 36 wherein the light is modulated at the Bohr frequency ω+ of the resonance.

39. (Original) The system of claim 36 wherein said atoms are rubidium atoms or cesium atoms.

40. Cancelled.